



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------|------------------|
| 10/532,560 | 04/25/2005 | Philippe Lescoche | 71247-0038 | 4389 |
| 22902 | 7590 | 02/06/2009 | | |
| CLARK & BRODY 1090 VERMONT AVENUE, NW SUITE 250 WASHINGTON, DC 20005 | | | EXAMINER MELLON, DAVID C | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1797 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 02/06/2009 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,560

Applicant(s)

LESCOCHE, PHILIPPE

Examiner

DAVID C. MELLON

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/25/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/5508)
Paper No(s)/Mail Date 20050805
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-9 in the reply filed on 12/16/2008 is acknowledged. The traversal is on the ground(s) that:

- The examiner has ignored the PCT rules for restriction and the mandate that a device and its method of use should be examined together.
- That the special technical feature cited is in both claims 1 and 10 and thus the restriction is improper.
- The examiner is in error in classifying the shared special technical feature and that in fact the shared special technical feature further includes the mean porosity gradient.

This is not found persuasive.

With regards to Applicant's argument that the Examiner has ignored the PCT rules for restriction, the Examiner has in fact followed the PCT rules for restriction as set forth in the MPEP 1893.03(d). Furthermore, with regards to the assertion that a device and its method of use should be examined together, the Applicant has not set forth a specific rule which mandates this. Additionally, the Applicant is advised that the current claims 1 and 10 are not a device and method of use but are in fact a device and a method of making. The preambles of the claims are as such: "Membrane for tangential filtration of a fluid to be treated" and "Method for fabricating a membrane for tangential filtration of a fluid to be treated".

With regards to Applicant's argument that the special technical feature cited in Pirbazari is in fact found in claims 1 and 10 and that the claims do share the same special technical feature thus making the requirement improper, Applicant is pointed to MPEP 1850 and PCT Rule 13. Specifically Applicant is pointed to PCT Rule 13.2 which details that the special technical feature shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art. The Examiner in making the requirement, set forth a shared special technical feature in the claimed invention and by citing the Pirbazari document, clearly identified that the special technical feature does not in fact lend contribution over the prior art.

With regard to Applicant's argument that the Examiner is in error in classifying the shared special technical feature and alleges that the mean porosity gradient is part of the shared special technical feature in claims 1 and 10, the Examiner respectfully disagrees. The Examiner notes that while claim 1 does in fact have a "mean porosity gradient" as a required limitation, claim 10 does not in fact have such a required limitation. The wording of claim 10 is "it is possible to obtain a mean porosity gradient" which implies that this is not a required outcome of the process but rather is a potential outcome. Accordingly, as the "mean porosity gradient" is not in fact a required feature of both claims 1 and 10, the unity of invention requirement made stands.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 10-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or

linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 12/16/2008.

Claim Objections

3. Claim 8 is objected to because of the following informalities:

- In line 2 of claim 8, "in substantially" should be corrected to "in a substantially".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, the claim is rendered indefinite because the claim does not distinctly set forth the metes and bounds of the limitation regarding to the mean pore diameter of the portion being increased. It is not clear however whether the porous support is naturally of a varying pore size or whether this is the result of the partial-pore filling of the porous support.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcera et al. (USP 6,375,014), in view of Childs et al. (USP 7,247,370), initial publication 1/30/2003 as WO 03/008078 with effective filing date 7/20/2001 from US Provisional 60/306412, and further in view of Grangeon et al. (USP 6,499,606) with French foreign priority date of 8/4/1999.

Regarding claim 1, Garcera et al. discloses a membrane with an increasing mean porosity in the direction of flow (Abstract) in figure 1 comprising:

- A porous support (1), delimiting at least one flow channel for fluid to be treated (2) flowing in a given direction between an inlet and an outlet (see in figure 1 arrows indicating direction of flow)
- Having variable partial-pore filling (C5/L50-65 – impregnation) on a portion of the support of a constant thickness creating a mean porosity gradient in the direction of the flow of fluid (Abstract, see section 3 in figure 1, "region impregnated", C4/L35-41), the minimum porosity being located at the inlet

and the maximum porosity at the outlet (C4/L23-35 – see also figure 1, decreasing amount of impregnation from inlet to outlet).

Garcera et al. does not explicitly disclose that the channel is coated with at least one separator layer or that the partial-pore filling is such that the partial-pore filling extends from the inner surface of the porous support.

Childs et al. discloses asymmetric membranes composed of a microporous substrate whose pores contain a cross-linked gel being greater at or adjacent to a surface of the membrane (Abstract) in figure 5, specifically the instance pictured on the left in figure 5. Childs et al. discloses that the pore filling gel can be placed in a configuration such that the porous support filled with the gel asymmetrically is facing the fluid flowing rather than being on the outside away from the flow of fluid (see figure 5 on the left and C8/L10-40).

Garcera et al. and Childs et al. are combinable because they are concerned with the same field of endeavor, namely that of pore filling of porous membrane supports.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the partial-pore filled membrane structure of Garcera et al. by making it such that the partial-pore filling occurs from the inside of the membrane to the outside as taught by Childs et al. for the purpose of decreasing the amount of fouling experienced by the membrane during operation.

Grangeon et al. discloses a cross-flow filter membrane (title) comprising a porous support and a separator layer (abstract) in figures 1-3. The membrane has an inorganic porous support (2) with a separator layer (4).

Garcera et al. and Grangeon et al. are combinable because they are concerned with the same field of endeavor, namely that of membranes using porous supports.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the porous support membrane of Garcera et al. to include the use of a separator layer as taught by Grangeon et al. for the purpose of improving the separation achieved by including a pre-filter component to the membrane.

Regarding claim 2, modified Garcera et al. discloses all of the claim limitations as set forth above. Furthermore, modified Garcera et al. inherently discloses a flux density gradient per unit of pressure with the minimum flux at the inlet and the maximum at the outlet since the porosity is lowest at the inlet and highest at the outlet.

Regarding claim 3, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. as modified by Childs et al. further discloses that the mean porosity of the support increases inside the support in a transverse direction to the direction of the flow of fluid between the inside surface and the outer surface (see figure 1 of Garcera et al. and further figure 5 of Childs et al.).

Regarding claim 4, modified Garcera et al. discloses all of the claim limitations as set forth above. Modified Garcera et al. further discloses that the variable partial-pore filling is made over a depth from the inner surface which decreases in the direction of flow (see figure 1 in Garcera et al. along with figure 5 of Childs et al., combined as such to create the partial-pore filling from the inside to the outside and a decreasing penetration depth in the direction of the fluid flow).

Regarding claim 5, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. further discloses that the pore size increases in the direction of the flow as the partial pore-filling decreases (C5/L1-20).

Regarding claim 6, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. further discloses that the partial pore-filling is obtained by penetration of the support with inorganic particles whose mean diameter is smaller than the mean pore diameter of the support (C6/L15-20 - 0.1-4 micron particles, C8/L10-21 - 12 micrometer initial pore diameter, C6/L5-10 - "inorganic" impregnation material).

Regarding claim 7, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. further discloses that the penetration of inorganic particles is followed by sintering (C5/L64-C6/L5).

Regarding claim 8, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. as modified by Childs et al. further discloses a mean porosity which increases in a substantially continuous manner in the direction of the flow of fluid to be treated to obtain a substantially constant permeate flow along the flow channel (see figure 1 of garcera et al., C5/L30--52).

Regarding claim 9, modified Garcera et al. discloses all of the claim limitations as set forth above. Garcera et al. does not explicitly disclose the use of mean porosity plateaus in the direction of flow, with the length of the plateaus being substantially identical.

Grangeon et al. in figure 3 discloses a thickness gradient in the separator layer that diminishes in steps P in the flow direction of the fluid to be treated (C4/L35-45) which are of substantially the same length.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mean porosity gradient of Garcera et al. such that it is stepwise using plateaus as taught by the separator layer of Grangeon et al. for the purpose of having areas of known mean porosity at constant levels rather than potentially variable continuous zones.

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcera et al. (USP 6,375,014), in view of Childs et al. (USP 7,247,370), initial publication 1/30/2003 as WO 03/008078 with effective filing date 7/20/2001 from US Provisional 60/306412, and further in view of Pirbazari et al. (USP 5,505,841).

Regarding claim 1, Garcera et al. discloses a membrane with an increasing mean porosity in the direction of flow (Abstract) in figure 1 comprising:

- A porous support (1), delimiting at least one flow channel for fluid to be treated (2) flowing in a given direction between an inlet and an outlet (see in figure 1 arrows indicating direction of flow)
- Having variable partial-pore filling (C5/L50-65 – impregnation) on a portion of the support of a constant thickness creating a mean porosity gradient in the direction of the flow of fluid (Abstract, see section 3 in figure 1, "region impregnated", C4/L35-41), the minimum porosity being located at the inlet

and the maximum porosity at the outlet (C4/L23-35 – see also figure 1, decreasing amount of impregnation from inlet to outlet).

Garcera et al. does not explicitly disclose that the channel is coated with at least one separator layer or that the partial-pore filling is such that the partial-pore filling extends from the inner surface of the porous support.

Childs et al. discloses asymmetric membranes composed of a microporous substrate whose pores contain a cross-linked gel being greater at or adjacent to a surface of the membrane (Abstract) in figure 5, specifically the instance pictured on the left in figure 5. Childs et al. discloses that the pore filling gel can be placed in a configuration such that the porous support filled with the gel asymmetrically is facing the fluid flowing rather than being on the outside away from the flow of fluid (see figure 5 on the left and C8/L10-40).

Garcera et al. and Childs et al. are combinable because they are concerned with the same field of endeavor, namely that of pore filling of porous membrane supports.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the partial-pore filled membrane structure of Garcera et al. by making it such that the partial-pore filling occurs from the inside of the membrane to the outside as taught by Childs et al. for the purpose of decreasing the amount of fouling experienced by the membrane during operation.

Pirbazari et al. discloses a microfiltration membrane (C2/L45-55) in figure 1 comprising a microfilter membrane on a membrane support.

Garcera et al. and Pirbazari et al. are combinable because they are concerned with the same field of endeavor, namely that of membranes using porous supports.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the porous support membrane of Garcera et al. to include the use of a microfiltration membrane on a membrane support as taught by Pirbazari et al. for the purpose of improving the separation achieved by including a pre-filter component to the membrane.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1, 3-9 are provisionally rejected on the ground of nonstatutory

obviousness-type double patenting as being unpatentable over claims 1, 3, 5-6, 9-14 of copending Application No. 11/587048. Although the conflicting claims are not identical, they are not patentably distinct from each other because the both are drawn to a

porosity gradient porous support membrane with a separation layer in which the porosity gradient is formed by partial pore filling or clogging. Further, the mean porosity is disclosed as decreasing both longitudinally and transversely with fluid flow and the membrane is disclosed as having a central channel or channels.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Darcovich et al., Processing of Functionally Gradient Ceramic Membrane Substrates for Enhanced Porosity.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID C. MELLON whose telephone number is (571)270-7074. The examiner can normally be reached on Monday through Thursday 7:00am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571) 272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

/D. C. M./
Examiner, Art Unit 1797